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ABSTRACT

Extensive research has been conducted examining the effects of teacher expectations on student performance, revealing reasonably consistent patterns of differential behavior by teachers toward high and low expectation students. Few theories which integrate isolated research findings into a causal sequence have emerged, however. One such model outlines the process through which teacher expectations may sustain student performance by proposing that teachers more frequently use negative affectively valenced feedback to low expectation students as a mechanism for interaction control, while high expectation students more frequently receive feedback based on their effort expenditure. These different evaluation contingencies lead to a lesser belief on the part of lows than highs that effort will influence academic outcomes. As with learned helplessness effects, differences in effort-outcome covariation perceptions may lead to less persistence and more failure on the part of lows than highs, thus sustaining poor performance. Support for several aspects of the model comes from varying sources, including this first attempt to test the entire hypothesized sequence within the same system of naturally-occurring teacher-student relations. (Author)

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Understanding Pygmalion:

The Social Psychology of Self-Fulfilling Classroom Expectations

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A Theoretical and Methodological Overview

Harris M. Cooper

We are here today to present the results of a year-long study conducted in elementary school classrooms. The study involved the observation of dyadic teacher-student interactions and the measurement of the interactors' cognitions concerning the dyadic relation. The cognitive variables were drawn from areas of active research interest in the field of social psychology. These areas include personal control and locus of control perceptions about oneself and causal attributions about the other dyad member. We had two purposes in undertaking the investigation. First, we wanted to see if these cognitions, and their relations to behavior, could be used as explanatory links in what is popularly called the classroom self-fulfilling prophecy. More specifically, we wanted to see if present social psychological conceptualizations could help explain how a teacher's expectation for student performance could enhance the likelihood that congruent actual performance occurred. Our second purpose was to determine if some previously reported relations were generalizable to the naturally occurring classroom. More broadly, we wanted to create a data set which would be of interest to both the educational practitioner and the social theorist. In the next twenty minutes or so, I would like to provide the framework surrounding the papers that follow. To do so I will need, first, to present a brief review of the expectation literature. This review will be followed by a statement of the expectation communication model which guided our research. Then, I will describe the sample of teachers and students who

provided all the data we collected. Finally, I will detail the rather unique data analysis strategy we employed and our reasons for choosing it.

Among the most well-known and controversial experiments in social psychology is Rosenthal and Jacobson's Pygmalion in the Classroom. This study attempted to determine whether expectation effects, which had been found to operate among laboratory experimenters, might also operate among elementary school teachers. Rosenthal and Jacobson (1968) reported evidence affirming the existence of such classroom self-fulfilling prophecies and a lively debate ensued. The debate focused mainly on differences in educators' beliefs concerning the inferential power of isolated studies, and on methodological problems associated with in vivo educational research. A decade's passing has not diminished interest in teacher expectation effects. In fact, in the past four years, four papers on this topic have been published in the Review of Educational Research. Most issues involving expectation effects have been addressed in multiple studies, often employing different methods. Our reading of this literature, which conforms to reviews published by Brophy and Good in 1974, Rosenthal in 1974 and Cooper in 1979, leads to a conclusion that although influences on student performance are multiple and complex, teacher expectations do play a role in student achievement. The research evidence, however, suggests some important qualifications to this contention. First, expectations probably serve more to sustain student achievement at a particular level, rather than radically alter achievement away from a prior course. The reason for this sustaining role

seems to be that expectations which depart dramatically from a student's actual achievement are difficult to maintain in the on-going classroom. This leads to the second necessary qualification: The relation between teacher expectation and student achievement is bidirectional. A student's actual performance serves as the primary influence on the expectation held by the teacher and a cyclical process of mutual influence seems best supported by the literature. Finally, it is evident that not all teachers are prone to expectation effects and teacher individual differences that mediate their appearance ought to be a high priority for future research.

Given the above assessment, it is natural to next ask, "how are teacher expectations communicated" and, "how do they come to influence student performance?" The overriding purpose of our research was an attempt to obtain information addressing these two questions. The key behavioral variables used in the search were chosen because previous educational studies had found them to be reliably associated with expectations. The social psychological concepts were chosen because their treatment in the basic research domain indicated they should provide satisfying explanations for the existence of these expectation-behavior linkages.

Table 1 of your handout states the four behavioral categories which have produced reliable associations with teacher expectations. The four categories are taken from Bob Rosenthal's 1974 paper.

First, teachers appear to create warmer socioemotional environments for brighter students. Videotapes of simulated tutorial

sessions have found that teachers who were interacting with students believed to be bright, smiled and nodded their heads more often than teachers interacting with slow students. Teachers also leaned towards brights and looked brights in the eyes more frequently. Classroom observers have also found teachers with induced high expectations were most supportive and friendly toward bright-labeled students. It seems, then, that many nonverbal behaviors associated with positive emotional attraction are displayed by teachers most frequently in interactions with students believed to be intelligent.

There is also evidence indicating that teachers' verbal inputs to students are dependent on performance expectations. Students labeled as slow have been found to receive fewer opportunities to learn new material and to have less difficult material taught to them. Thus, the quantity and quality of teacher attempts at novel instruction seem associated with expectations.

The third factor, verbal output, can be operationally defined as both the teacher's persistence in insuring that interactions end in a satisfactory way and the frequency with which academic interactions take place. With regard to teacher persistence, observation indicates that teachers tend to engage in more clue giving, more repetition, and more rephrasing when highs answer a question incorrectly than when lows answer incorrectly. Teachers have also been found to pay closer attention to responses of students described as gifted and to allow bright students more time before redirecting unanswered questions to other class members.

Among the best researched behavior correlates of performance expectations, and one which is central to our explanation,

is the absolute frequency of teacher-student interaction. Brophy and Good in 1974 cited 20 studies (primarily naturalistic observation) in which the frequency of teacher-student interactions was assessed. Strongly supported by these 20 studies is the finding that high expectation students will seek more academic contact with the teacher than low expectation students. What varies in the studies is whether teachers equalize or accentuate this difference through their own initiation.

The final factor, also crucial to our model, is feedback. This factor involves the teachers' use of praise and criticism after an academic exchange. As with student initiations, a fairly consistent pattern of teacher use of reinforcement is found. Teachers tend to praise high expectation students more and proportionately more per correct response while lows are criticized more and proportionately more per incorrect response. This result is based on some studies which simply count positive and negative use of affect and some which, allowing for the greater opportunity available to be positive toward highs, adjust praise and criticism use by the number of correct and incorrect responses the students made. Table 1 also provides some references for the listener who might want to inspect the expectation-behavior literature more closely.

For some of the behavior differences just outlined, the relation to performance seems fairly strightforward. Students who are taught less difficult material and who are presented with less novel instruction should eventually possess correspondingly less information. In addition, a student given less time to respond will less often answer correctly. The remaining differences, however,

in socioemotional climate, student initiations, and teacher feedback, seem less clearly linked to expectation effects. The purpose of our research and its underlying model was to integrate the climate, feedback, and initiation factors into a single process culminating in sustained student performance. However, because our model is based on the assumption that at least initiation and feedback differences are operating, we also wanted to demonstrate their existence in our own sample of teachers. Sherry Blakey's paper addresses this attempted replication, and is the first such study to examine expectation-behavior relations at three separate times during the school year.

Figure 1 of your handout summarizes how we speculate that the expectation communication process might proceed. The model begins with the contention that teachers form differential expectations for student performance. The fact that performance expectations vary is beyond argument. The point is made here to insure that we begin with the teacher's "raw data" and that the process' non-recursive nature is made explicit.

The model next proposes that, not only do teachers form differential perceptions of students, but they also cognitively distinguish between classroom interaction contexts. Specifically, classroom situations differ in the amount of personal control they allow a teacher, and teachers may be aware that such differences exist. In teacher-initiated interactions, for instance, the teacher has chosen the question and the student who is to respond. In student initiated interactions, on the other hand, the child has at least phrased the question and has determined to some extent

that he or she will be involved. Presumably, then, most teachers will feel the greatest degree of personal control over what an interaction will be about and when it will occur when they themselves are the initiators.

The interaction setting may also influence control beliefs. Interactions in public settings must be geared to group needs. Private interactions, in contrast, afford the teacher more flexibility in determining how long a topic can be pursued. Taken together, we might speculate that teacher initiations in private are viewed by teachers as affording most personal control while student initiations in public afford the least. Gail Hinkel's paper presents a test of these notions.

The magnitude of the proposed situational distinctions in control should depend on student characteristics as well. In particular, high expectation students "carry around" with them a high degree of controlability. Control of low expectation students, however, may be more situationally dependent. Teachers may feel their own initiations toward slows provide perceptibly more control for themselves than when slow students do the initiating. More important, teachers may believe that the more control over slow students a context affords them, the more likely it is that the exchange will be fruitful. Therefore, because slow initiations are least controllable they may also be viewed as least desirable.

This personal control notion provides the link between expectations and observed patterns of classroom feedback and climate. Specifically, teachers can maximize control over slow students by inhibiting slows' initiations. Such a strategy would entail the use of simple reinforcement principles. The teacher

increases personal control through the creation of an unrewarding socioemotional environment and the relatively infrequent use of praise and freer use of criticism in interactions with lows. Gail's paper also explores hypotheses related to this issue.

The use of feedback and climate to control interactions has other implications, however. A control strategy means high and low students are evaluated using different contingencies. Some teachers may tend not to praise strong efforts from lows because praise will reduce future personal control by encouraging slow student initiations. They may also tend to be more critical of weak efforts from lows since criticism increases future control. In evaluating highs, teachers may dispense praise and criticism more dependent on exhibited effort, since future control of highs' behavior is less of an issue. Jerry Burger's paper addresses this differential contingency hypothesis, as well as more general issues concerning the relations of teacher attribution and feedback use.

Moving to the feedback-initiation link, there is considerable evidence indicating that praise and criticism, and the emotional climate produced by the teacher, are causally linked to rates of student initiation. These studies indicate that praise, attention, head nodding, and expressions of agreement increase classroom participation rates, while criticism, ignoring responses, and expressions of boredom decrease participation rates.

It is argued, then, that the climate, feedback, and output factors may be causally linked. The three factors are integrated if their relation to teacher personal control is taken

into account. Negative climate and feedback patterns for low expectation students increase teacher control over when interactions with these students will occur. However, the control strategy also means lows will seek less interaction with the teacher and teacher feedback to lows will be less effort-contingent than feedback to highs. The sustaining of low expectation student performance is viewed as a result of these different feedback contingencies. Again, the concept of personal control provides the conceptual bridge.

For achievement motivation to be maintained it is necessary that students believe they can influence their academic outcomes. For example, Kukla in 1972 found that students who were high in achievement motivation believed that effort and performance outcome covaried. They believed the harder they tried the more likely they were to succeed. Students low in achievement motivation perceived less effort-outcome covariation. No matter how hard they tried, these students perceived themselves as less able to influence the outcomes of their performance. This perception on the part of low expectation students may be an accurate reflection of their classroom environment. High expectation students may be criticized when the teacher perceives them as not having tried and may be praised when efforts are strong. Low expectation students, however, may be praised and criticized more often for reasons independent of their personal efforts, namely, the teacher's desire to control interactions. A greater use of feedback by teachers to control interactions may lead to a lesser belief on the part of the student that his or her effort can bring success. John Sterling's paper looks at the relation between teacher expectation and student effort-outcome covariation beliefs. In addition, John's paper addresses the general issue

of how student locus of control and classroom behavior relate to one another.

To complete the expectation process, the effects of perceived noncontingent reinforcement need to be stated. Most of the research associated with learned helplessness phenomena would be relevant here and I obviously lack the time to review this area. Let me just say that much research indicates at least three effects of feeling little personal control over academic performance. Little perceived effort-outcome covariation leads to negative affect and attitudes towards tasks presented, less persistence in the face of failure, and finally, a greater incidence of failure. With the translation of student beliefs into student performance the expectation communication model is completed.

The papers that follow are tied together not only by the communication model but also by the fact that they share a common data base. Thus, while most of the evidence supporting the various model links come from separate studies, our investigation is the first attempt to test most of the links in a single sample of clasrooms.

Our sample contained 17 3rd, 4th, and 5th grade classrooms, though for some analyses one or two classrooms are missing. The 17 classrooms were drawn from 5 schools serving mostly white, middle and lower middle class families. All 17 classrooms had female teachers whose participation was voluntary. The teachers averaged over 8 years of teaching experience. Student participation was also voluntary, and only students returning informed consent letters took part in the study. About 60% of the students asked to participate agreed to do so.

A three step procedure was used to determine which students in each class would actually be the targets for the investigation. First, teachers were asked to rank all consenting students twice, according to their "probable success at verbal tasks" and their "general academic potential." The average correlation between these two rankings was .88. Second, males and females separately were divided into three expectation groups, based on these rankings. Finally, two males and two females were randomly chosen from each expectation third. In sum, then, 12 students within each of the 17 classes served as targets. Six of the students were males and 6 were females with 2 males and 2 females at each level of relatively high, average, or low expectations.

There is one final link between the papers that follow. This link involves the data analysis strategy used to describe relations and to make inferences concerning population parameters. I would like to take a few more minutes to describe this strategy, since some of its elements may be unfamiliar to you.

Because the problem of how to analyze classroom data is one which has troubled educational and social researchers for some time, it is necessary that I present some observations with a considerably broader focus than teacher expectation effects.

The social psychology of education has one primary attribute which distinguishes it from other fields: the social relations of interest are embedded within a context called "the classroom." To ignore the classroom when one studies social relations in schools robs the subdiscipline of its unique character. More important, it ignores the fact that individuals' responses are dependent on facets of the broader environment in which they occur.

Cronbach, in 1976, suggested three reasons why individual responses in classrooms cannot be viewed as independent of their general setting. First, persons within a class are more alike at the outset of instruction than persons randomly sampled from the relevant population. The nonrandom placement of persons into classrooms means classrooms exhibit differing levels of traits found in the population, for example, differing average achievement levels or average frequencies of particular behaviors.

Second, persons within classrooms will be similar to one another, but potentially different from persons in other classrooms, because of intended difference in the way classrooms are treated. Such treatments include variations in the textbooks that are used or in the way seating is arranged. Of more importance, the teacher can be conceptualized as just such an intended treatment. Teacher "treatments" would include characteristics like teaching experience, educational philosophy, global perceptions of the class and the frequency of particular teaching behaviors.

The final context effect suggested by Cronbach is unintended treatments. Though these influences are not specifically planned, they serve to increase the similarity of persons in the same classroom, relative to others. These variations would include things like room temperature and room location.

It can be said, then, that the classroom is an undeniable aspect of education's social fabric. Now we must ask "how does one go about studying classroom social relations in a manner which captures the topics contextualized nature?" One approach readily presents itself: social psychologists can study classrooms as whole groups, or as units that have characteristics which exist at a

group level of analysis. Specifically, it might be of interest to determine how classroom variations, in trait samplings and intended and unintended treatments, relate to one another. These lines of investigation would include questions like, "Is a teacher's choice of presentation styled related to the classroom's average achievement level?," or "Does a class' average attitude toward school relate to the average frequency with which classroom rules are broken?" These kinds of questions can be said to examine processes which exist at the whole-class level. Answering these questions involves examining the variations between entire classrooms.

While whole-class characteristics are certainly important, they do not encompass all the questions social psychologists typically find interesting. Also of concern is the examination of relations between individuals within the same class. For example, we often want to know if a teacher's attitude toward a particular student (or a student's attitude toward the teacher) relates to the way the teacher and student interact. This type of question, addressing a teacher's relative treatment of different students in the same class, is of paramount importance in the research which follows. Of interest here are processes that exist at a within-class level. They are concerned with how persons within classrooms relate to one another.

Since it is possible to identify two levels of classroom process we must next ask if it is necessary for the researcher to choose to study one process level or the other. The answer is "not always." It is possible to study within-classroom relations and certain types of between-classroom relations with a single set of data. This is so because some whole classroom variables

are derivable from the basic data employed in within-class analyses. Since this strategy is used extensively in the papers that follow, a few moments to present its details will prove valuable. Figure 2 presents the strategy visually.

First, it is assumed that at least three pieces of information are available on any single student. These are the classroom the student is in, and the student's status on two variables, say, X and A. It is possible, in such a data set, to identify two sources of variance in scores: variation associated with the general level of the variable in the class and variation due to the students' own deviation around this general level. These two sources of variance separately measure the whole- and within-classroom process levels. The two sources are also entirely statistically independent of one another. Knowing an average classroom score on X by definition tells us nothing about the deviations around X in any given classroom. This statistical independence reveals that no a priori grounds exist for believing that a relation found at one process level will also be found at the other. Without knowing the process level to which research evidence relates we will confuse our literature and may suggest reforms which interfere with good educational practice.

How, then, do we test the relations at the two levels separately? Examining relations at the whole classroom level is a straightforward task. First, the classroom average scores on variables X and A are obtained. These averages are then paired and correlated with one another to yield a measure of relationship strength. This correlation relates to the association between the two whole-class characteristics.

Developing a measure of within-classroom relations is a more difficult task. The one suggested here, though others are available, involves three steps. First, for each classroom separately, the X and A scores for students are paired and correlated with one another. This correlation gauges the relation between variables X and A within the particular classroom. The correlations are then transformed into Z-scores to normalize their sampling distribution. Finally, Z-scores are entered into a one-sample t-test, as one might do with any other set of independent measurements. The appropriate t-test formula is presented at the bottom of Figure 2. The null hypothesis value in the formula is set to zero so that the observed Z-scores are tested against the alternative that no relation exists in the sampled population.

There are several important consequences to the adoption of the process level specification approach. The most important is that choosing the classroom to be the smallest data unit makes the analysis low in power. In the present investigation, for example, measurements were obtained on as many as 204 students, yet only 16 degrees of freedom were available for most inference tests. There seems no way around this dilemma, however, other than to say that the question ought to be more one of appropriateness than statistical power. Three alternatives to the process level specification approach are possible and all are found to be inferior. First, researchers can ignore the process level distinction entirely and use unadjusted raw scores as data. Results obtained with this technique have no process referent, and ignore a source of variance, the classroom, known to have a strong impact on psychological variables.

A second strategy involves studying within-classroom processes but employing the student as the unit of analysis. This strategy will produce results similar to the within-classroom strategy employed here, though it is questionable whether student deviations around a classroom mean can be considered independent of one another. As Page, in 1975, and others have argued, it is likely that the student-as-unit strategy underestimates the alpha probability levels associated with findings.

A third approach to data analysis is to measure relations for entire classrooms only. This strategy is perfectly legitimate. However, it only addresses one level of social psychological process (between entire classrooms), and may therefore ignore important social psychological phenomena.

What, then, can we do to counter the low power of legitimate classroom data analyses? Cronbach takes an exceptionally pessimistic view of the role of inference testing in classroom research. He states:

> The traditional research strategy--pitting substantive hypotheses against a null hypotheses and requiring statistical significance of effects--can rarely be used in educational research. Samplings large enough to detect strong but probabilistic effects are likely to be prohibitively costly.

We suggest a more hopeful alternative. Researchers with small numbers of classrooms might interpret relations falling between, say, the .05 and .19 levels of significance as "deserving further study," <u>if</u> these probabilities are associated with relatively large effects. This convention is employed in the papers that folow. Relations which account for 10% of the variance in scores are described as worthy of attention, especially if the relation is

consistently found over the course of the school year. Researchers with very small sample sizes (say less than 8 or 10 classrooms) might be advised to report raw data. As evidence in the literature accumulates, raw data from separate studies can be combined for purposes of inference testing.

A final means for increasing power is to increase the precision of analyses by crossing variables in multifactored designs. We have employed this strategy when the within-classroom relations of expectations to other variables were tested. Specifically, in some of the analyses that follow teacher expectation and student gender, as well as other variables, are treated as repeated measurements on the same classroom. Teacher expectations crossed by other variables were then used in analyses of variance. Where multiple dependent variables are involved, multivariate analyses were first performed and only significant MANOVA effects were followed by univariate analysis.

I realize I have tried to convey, in a few short minutes, a large amount of perhaps unfamiliar information. If I have left some of you with less than a full sense of understanding, I hope the papers which follow will complete my assignment. Let me close by saying that we are attempting the difficult task of bridging the gap between social theory and educational practices. We are attempting to do so with a heavy emphasis on context, which demands that we collect our evidence in noise-filled, nonlaboratory research settings. Finally, we are attempting to weigh both statistical and clinical significance as we sift through our data. Hopefully, the result is a meaningful and reliable description concerning the social psychology of education.

A Theoretical and Methodological Overview

Harris M. Cooper

University of Missouri-Columbia

Some Characteristics of the Participating Schools, Teachers and Students

Schools:

N = 5

Location:

Columbia, Missouri (pop. 90,000).

SES:

3 in-city, middle class schools;
1 edge of city/rural, upper middle class school;
1 edge of city, lower middle class school (one-third black).

Sampling Procedure:

Suggested as cooperative; 5 of 5 school principals asked agreed to let their school participate.

Classrooms:

N = 17; all female teachers.

Grades: 3, 4, and 5.

Average Teaching Experience: 8.7 years (sd = 3.9 years).

Sampling Procedure: Solicitation by principal or investigators plus $50 honorarium.

Students per Classroom: (total students = 204)

N = 12; 6 males, 6 females; 4 high, 4 average, 4 low expectation.

Sampling Procedure:

1) only students returning informed consent (approximately 60% of student's solicited agreed to participate);
2) division of volunteers into thirds based on teacher expectation rankings of "probability of success at verbal tasks" and "general academic potential";
3) random sampling of two males and two females within each expectation third.

Table 1

Some Evidence Supporting Teaching Behavior Differences

Dependent on Performance Expectations

---

1. Teachers create warmer SOCIOEMOTIONAL ATMOSPHERES (smiles, nods, body lean) for higher expectation students.

   Chaikin, A., Sigler, E. & Derlega, V. Nonverbal mediators of teacher expectancy effects. Journal of Personality and Social Psychology, 1974, 30 (1), 144-149.

   Kester, S. & Letchworth, G. Communication of teacher expectations and their effects on achievement and attitudes of secondary school students. The Journal of Educational Research, 1972, 66, 51-55.

   Page, S. Social interaction and experimenter effects in the verbal conditioning experiment. Canadian Journal of Psychology, 1971, 25, 463-475.

2. Teachers attempt more VERBAL INPUT (novel and more difficult instruction) to higher expectation students.

   Beez, W. Influence of biased psychological reports on teacher behavior and pupil performance. In M. W. Miles and W. W. Charters, Jr. (Eds.), Learning in Social Settings. Boston, Mass.: Allyn and Bacon, 1970.

   Carter, R. Locus of control and teacher's expectancy as related to achievement of young children. Unpublished doctoral dissertation. Indiana University, 1969.

   Cornbleth, C., Davis, O., and Button, C. Expectations for pupil achievement and teacher-pupil interaction. Social Education, 1974, 38 (1), 54-58.

3. Teachers accept more VERBAL OUTPUT from higher expectation students.

   a) Teachers PERSIST (give clues, repeat) more when high expectation students fail.

   Brophy, J. & Good, T. Brophy-Good system (Teacher-child dyadic interaction). In A. Simon and E. Boyer (Eds.), Mirrors for Behavior. Philadelphia: Research for Better Schools, Inc., 1970b.

   Rothbart, M., Dalfen, S. & Barrett, R. Effects of teacher's expectancy on student-teacher interaction. Journal of Educational Psychology, 1971, 62, 49-54.

   Rowe, M. Wait time and rewards as instructional variables, their influence on language, logic and fate control. Journal of Research in Science, 1974, 11 (4), 291-308.

b) Higher expectation students INITIATE more teacher-student academic exchange.

See Brophy, J. & Good, T., 1974 for a review of pre-1974 evidence.

Given. B. Teacher expectancy and pupil performance: Their relation to verbal and non-verbal communications by teachers of learning disabled children. Unpublished doctoral dissertation, Catholic University of America, 1974.

Firestone, G. & Brody, N. Longitudinal investigation of teacher-student interactions and their relation to academic performance. Journal of Educational Psychology, 1975, 67 (4), 544-550.

4. Teachers PRAISE higher expectation students MORE often and/or CRITICIZE higher expectation students LESS often (either in absolute frequency or with adjustment for the student's frequency of appropriate and inappropriate responding).

See Brophy, J. and Good, T. (1974) for a review of pre-1974 evidence.

Firestone, G. & Brody, N. Longitudinal investigation of teacher-student interactions and their relation to academic performance. Journal of Educational Psychology, 1975, 67 (4), 544-550.

Cooper, H. & Baron, R. Academic expectations and attributed responsibility as predictors of professional teachers' reinforcement behavior. Journal of Educational Psychology, 1977, 69 (4), 409-418.

Note. The categorization scheme is adopted from Rosenthal (1974).

Figure 1
A Model for Expectation Communication and Behavior Influence

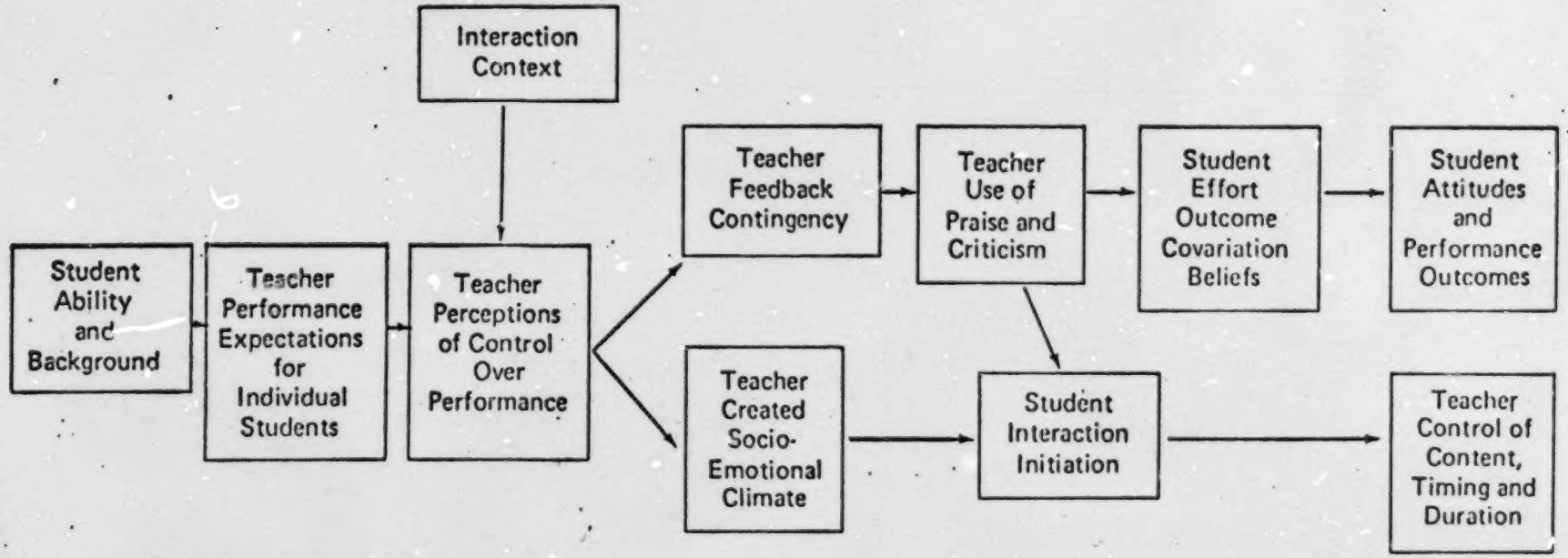
Interaction Context
Student Ability and Background
Teacher Performance Expectations for Individual Students
Teacher Perceptions of Control Over Performance
Teacher Feedback Contingency
Teacher Use of Praise and Criticism
Student Effort Outcome Covariation Beliefs
Student Attitudes and Performance Outcomes
Teacher Created Socio-Emotional Climate
Student Interaction Initiation
Teacher Control of Content, Timing and Duration

Figure 2

A Mathematical Demonstration of How Between and Within Classroom Relations Are Independently Measured and Subjected to Inference Testing

Purpose	Level of Analysis: Between Classrooms	Level of Analysis: Within Classrooms
	Added Separately	Paired Observations
Creation of Independent Measurements (for Classroom N)	Student$_1$ scores X and A	Student$_1$ scores $X - \overline{X}$ and $A - \overline{A}$
	Student$_2$ scores X and A	Student$_2$ scores $X - \overline{X}$ and $A - \overline{A}$
	.	.
	.	.
	.	.
	.	.
	Student n scores X and Y	Student n scores $X - \overline{X}$ and $A - \overline{A}$
	Average Classroom N scores $\overline{X}$ and $\overline{A}$	Correlation between $X - \overline{X}$ and $A - \overline{A}$
	Paired Observations	
Inference Testing (for sample)	Classroom 1 $\overline{X}$ and $\overline{A}$	Classroom 1 $Zr_{(X-\overline{X})\ (A-\overline{A})}$
	Classroom 2 $\overline{X}$ and $\overline{A}$	Classroom 2 $Zr_{(X-\overline{X})\ (A-\overline{A})}$
	.	.
	.	.
	.	.
	.	.
	Classroom N $\overline{X}$ and $\overline{A}$	Classroom N $Zr_{(X-\overline{X})\ (A-\overline{A})}$
t-test of the	Correlation between $\overline{X}$ and $\overline{A}$	One sample t-test ($= \overline{Z}-0/\text{sd}\ \overline{Z}/\sqrt{N}$)

Notes. X, A = variables to be related

$\overline{X}$, $\overline{A}$ = average variable score for students in a particular classroom

$Zr_{(X-\overline{X})\ (A-\overline{A})}$ = the z-score transformation of the correlation between $(X-\overline{X})$ and $(A-\overline{A})$.

n = the number of students in a class

N = the number of classrooms in the sample

TEACHERS AS PREDICTORS OF STUDENT BEHAVIOR: EXPECTATIONS IN CLASSROOMS

by Sherry L. Blakey

Classroom research has revealed reasonably consistent patterns of differential behavior by teachers toward high and low expectation students. Brophy & Good, in 1974, suggested that these patterns are often consistent with the production of self-fulfilling prophecies. In addition, research suggests that students perceive that teachers react differently to high and low achievers, indicating some behavioral differences may be substantial.

Besides the Rosenthal typology that Harris Cooper presented, Good & Brophy, in 1977, have summarized behavioral differences associated with expectations that have been found in at least two studies. Among these behaviors were that:

1. teachers wait less time for lows to answer
2. teachers do not stay with lows in failure situations
3. teachers reward inappropriate behavior of lows
4. teachers criticize lows more frequently than highs
5. teachers praise lows less frequently than highs
6. teachers give less feedback to lows in public
7. teachers pay less attention to lows
8. teachers call on lows less often in public, and
9. teachers seat lows further from themselves.

Our primary purpose in performing the analyses that follow was to replicate some of these findings, specifically those which have been incorporated into the expectation communication model.

Another important aspect of research on expectations concerns changes in teacher-student interaction patterns over the course of the school year. Despite the considerable research activity, there is still very little data available to describe the differences that occur in teacher and student interactions as the year progresses. One important area of concern involves the polarization of student

behavior, or the possibility that lows and highs become more distinct in their behavior and achievement over time due to varying teacher treatment. Some empirical evidence on the polarization issue has found that teacher behavior unnecessarily widens differences between students as a function of group placement.

However, as observational measures of teaching were not a part of these group placement studies, it is difficult to examine possible changes in teacher and student behavior. Observational measures collected in other studies have not been successful in testing the polarization issue mainly because of small samples of classrooms. What is needed, then, is a large-scale study, including a large number of teachers, and spanning the entire school year. Filling this need was our second objective.

Method

Information concerning observer training and reliability, as well as characteristics of the subject matters and times observed, are given on my paper title sheet. Rather than repeat this information, I would like instead to give a fuller description of the behaviors we coded.

Observed behaviors. For each of the twelve students, the frequency of seven interaction contexts were observed. Four of these contacts dealt with academics. They were:

1. teacher-initiated public interaction: When the teacher asked a question in front of a group of students and then called on the student to respond (with or without a raised hand).

2. child-initiated public interaction: When a child raised a hand in front of a group and asked a question unprompted by the teacher.

3. teacher-initiated private interaction: When the teacher spoke to the child, not meant to be overheard by others.

4. child-initiated private interaction: When the child asked a question not meant to be overheard by others.

Three other contacts deal with nonacademic matters. These were:

5. teacher-initiated procedural interaction: When the teacher told the student a classroom rule or asked the child to carry out a classroom chore.

6. child-initiated procedural interaction: When the child asked about a classroom rule or asked to perform a classroom chore. And finally,

7. behavioral interaction: When the teacher spoke to the student relating to misconduct on the student's part.

In addition, each interaction was coded into two categories of appropriateness:

1. A correct or appropriate response was coded when the child's response to a teacher initiation was deemed right or when a child's initiation was deemed an appropriate question to ask.

2. An incorrect or inappropriate response was coded when the answer was wrong or the question inappropriate.

Finally, an interaction was also coded when one of the following three types of feedback occurred:

1. Praise: When the teacher responded enthusiastically or warmly toward the child's response;

2. Criticism: When the child's response was incorrect and the teacher reacted with negative emotion or disappointment; And

3. No feedback: When the child's participation in the interaction was ignored and the teacher moved on without recognizing the effort.

Creation of Measurements. To create seven interaction context measures for each child, the frequency with which he or she interacted with the teacher in a particular context was divided by the number of hours the child was observed. These per-hour frequencies control for differences in classroom observation lengths and for student absences. A similar adjustment was made in the measures of appropriate and inappropriate responses by the student and in the

frequency of the three types of feedback. Finally, to create qualitative feedback measures, the student's praise per hour measure was regressed on the student's appropriate response measure within each classroom separately, and the residualized praise score used to define "praise following an appropriate response." Criticism was similarly adjusted by inappropriate responses and no evaluation by total responses. A student's relative feedback score, therefore, represents his or her receiving of affect relative to other class members and given equal rates of appropriate or inappropriate responding. A separate score for each of the 15 measures was created for each time period (Fall, Winter, and Spring).

The 15 observatinal measures were placed into five groups representing different aspects of classroom interaction. These 5 groups were: (1) appropriateness, (2) academic initiation, (3) nonacademic interaction, (4) absolute feedback, and (5) residual feedback. A three-way repeated measures multivariate analysis of variance was then conducted on each of the five observational clusters before univariate analyses of variances were performed. If the MANOVA for a particular effect was significant, then separate ANOVAS were run for each of the group's measures.

Results

The MANOVA for level of expectation revealed significant effects on four of the five groups of variables. Seven of the twelve univariate ANOVAS were found to be significant and these results are summarized in Table 1. As can be seen, high expectation students created more public interactions with teachers, provided more appropriate responses to academic questions, and

made fewer inappropriate responses to teacher questions than did low expectation students. Furthermore, it can be seen that teachers addressed more public interaction and praise to highs than to lows. Finally, teachers were observed to criticize academic responses and to provide behavioral feedback about misconduct more frequently to lows than to highs.

To consider time effects, the MANOVA revealed three significant multivariate centroids. However, only two of the nine ANOVAS associated with these three clusters produced significant effects, as seen in Table 2. In particular, it was found that teachers decreased their private interaction with students as the year progressed and that the frequency of student-initiated academic statements in public increased as the year progressed. Hence, teachers appear to become somewhat less active as the year progresses and students become more active.

The multivariate analysis for the gender effects revealed that two of the five observational clusters had significantly different centroids. In subsequent analyses, two of the seven ANOVAS proved to be significant, as shown in Table 3. It was found that girls approach teachers more frequently than boys in private and that teachers provided behavioral feedback about misconduct more frequently to boys than to girls.

Results from all four interaction effect analyses are presented in Tables 4 and 5. Two strong interactions appear between time and expectation level and shows that both in terms of absolute praise and praise per correct response, that praise drops for all students during the course of the school year, and especially for high expectation students. Another finding was a sex X expectation interaction showing that teachers have

proportionately more of their private interactions with lows, but expecially low girls.

Discussion

In sum, our findings replicate previous results found by investigators using the Dyadic Coding System. All three of the behavioral differences cited in Good & Brophy in 1977, that were retested in the present investigation were replicated. Thus, the data illustrate that teachers behave differently towards high and low achievers and that these two groups of students behave differently in the classroom.

Since there was variance in teacher behavior toward highs and lows, it was possible to explore the polarization issue. In general, it appears that teacher and student behavior did not change appreciably across the year. One notable exception was the frequency and distribution of teacher praise. In particular, highs received more teacher praise early in the year. Such teacher behavior may indicate to students which pupils are the ones to "model" and/or illustrate to the class what type of classroom performance the teacher considers desirable.

Interestingly, teacher afforded private contacts with students decreased as the year progressed while the frequency of child initiated academic contacts in public increased over time. In combination, these two patterns may indicate that teachers become less active as the year goes on. That is, early in the year teachers may attempt to socialize students into expected roles and subsequently ease up direct efforts in this regard as students accept their roles.

To conclude, while a general replication of previous expectation behavior linkages were found, we uncovered some evidence that teacher differences may fade as the year progresses, whereas student differences remain fairly stable.

Sherry Blakey
University of Missouri--Columbia

Some Characteristics of the Classroom Observation Procedure.

Observers:

Masters level graduate students ("blind" to all cognitive measure results).

Observation Scheme:

The Teacher-Child Dyadic Interaction System (Brophy and Good, 1969) with modifications (Cooper, et al., 1979).

Observer Training:

Through the use of discussion, classroom transcripts, videotape.

Observation Schedule:

First Observation: Sept. - Oct. 1978
Second Observation: Jan. - Feb. 1978
Third Observation: Apr. - May 1978

Observer Reliabilities:

For transcripts, $\bar{k}$ = .84
For videotape, $\bar{k}$ = .85
In class % agreement (Sept.) = 91%
In class % agreement (Jan.) = 88%
In class % agreement (Apr.) = 74%

Behaviors Observed:

Teacher/Student Initiations in Public/Private Settings.

Whether the response or initiation was Appropriate/Part Appropriate/Inappropriate and Praised/Affirmed Right/Given No Evaluation/Told Wrong/Criticized by the teacher.

Procedural and Behavioral interactions were also recorded.

Subject Matter Observed:

Social studies, language arts, science.

Observation Duration:

Sept. - Oct. = 7.2 hours per classroom (s.d. = 1.1 hours).
Jan. - Feb. = 9.5 hours per classroom (s.d. = 1.0 hours).
Apr. - May = 8.4 hours per classroom (s.d. = 1.3 hours).

Table 1

Relations of Teacher Expectations to Some Classroom Behaviors

Behavior	Level of Expectation: High	Average	Low	F^1	p
Child Initiations in Public	.514	.446	.315	7.44	.011
Appropriate Responses	2.41	1.93	1.51	25.93	.0001
Inappropriate Responses	.507	.665	.687	4.38	.045
Teacher Initiations in Public	1.92	1.67	1.33	17.41	.0002
Praise	.326	.199	.185	17.70	.0002
Criticism	.023	.039	.063	5.32	.029
Behavioral Interventions	.234	.234	.416	11.14	.003
No Evaluation	.094	.103	.121	<1	.39
Praise Following Appropriate Responses[2]	+.028	-.030	+.002	1.19	.28
Criticism Following Inappropriate Responses	-.004	-.004	+.008	1.84	.19
No Evaluation Following Any Response	-.000	+.008	-.008	<1	.50

Notes: 1. F-values are for linear expectation effects. No curvilinear effects proved significant df = 1,30.

2. The three relative feedback analyses use as data the three types of feedback after they had been residualized by the relevent response category within each classroom separately. The means, therefore, represent the teachers use of feedback relative to other class members, given equal rates of appropriate and inappropriate responding.

Table 2

Classroom Behaviors Found Significantly Related to Time of School Year

Behavior	Time of Year: October	February	May	F[1]	P
Teacher Initiations in Private	.36	.28	.19	5.62	.025
Child Initiations in Public	.31	.49	.47	7.49	.011

Note: 1. F-values are for linear time effects. No curvilinear effects proved significant, df = 1,30.

Table 3

Classroom Behaviors Found Significantly Related to Student Gender

Behavior	Student Gender: Female	Male	F	P
Child Initiations in Private	.64	.42	21.71	.001
Behavior Interventions	.21	.42	11.70	.004

Note: df = 1,15.

Table 4

Classroom Behaviors Found Significantly Related to

Teacher Expectations in Interaction With Time of School Year

		Level of Expectation		
Behavior	Time	High	Average	Low
Praise [1]	October	.44	.23	.21
	February	.32	.20	.18
	May	.22	.17	.17
Praise Following Appropriate Responses [2]	October	+.14	+.00	+.03
	February	+.01	-.04	-.01
	May	-.06	-.05	-.02

Notes: 1. The interaction F-value was 3.21, df = 4,58, $p<.02$.

2. The interaction F-value was 2.71, df = 4,58, $p<.04$.

Table 5

Classroom Behaviors Found Significantly Related to

Teacher Expectations in Interaction with Student Gender

		Level of Expectation		
Behavior	Gender	High	Average	Low
Teacher Initiations in Private	Female	.29	.26	1.21
	Male	.24	.25	.43

Note: The interaction F-value was 7.98, df = 2,30, $p<.002$.

Teacher Perceptions of Personal Control

Gail M. Hinkel

In an attempt to increase understanding of when and how teachers communicate differential expectations, it has been proposed that interaction control perceptions mediate the expectation-behavior relation, especially through the teacher's use of affective feedback (i.e. praise and criticism). Specifically, it is felt that teachers' perceptions of interaction control are influenced by three aspects of classroom context: the interaction initiator, the classroom setting (public vs. private), and the stable probability of success, that is, the teacher's expectation that a child will succeed or fail. Interaction control is viewed, in addition, as having three dimensions: content (what the interaction is about), timing (when it occurs), and duration (how long it lasts). Teachers are said to interpret the potential success of any single teacher-student interaction in relation to how these three dimensions of control are influenced by the three aspects of classroom context.

Research by Cooper, Burger, and Seymour found that teachers reported more control when they interacted with high expectation students than when they interacted with low expectation students. Teachers also reported greater control when they initiated interactions than when exchanges were student-initiated. Results concerning the setting (public versus private) aspect of context were obtained in the predicted direction (that teachers would feel more control over private interactions) but tended to be very weak. The first objective of the study described in this paper was to determine if these previous findings could be replicated in naturalistic classrooms.

A second objective was to determine how interaction control mediates the expectation effect. It is proposed that because interactions with low expectation students are less controllable than those with highs, teachers might attempt to channel interactions with lows into more controllable situations (i.e. teacher initiations and/or private settings). In order to achieve this end, teachers could differently administer feedback to students, dependent on expectations. Low expectation students might be criticized more freely to inhibit their initiations, and might be praised less freely in order to avoid encouraging initiations. Expectation-behavior linkages are found to be congruent with this model. What remains to be shown, then, is that interaction control perceptions, which are said to mediate this link, also relate to behavior in the predicted manner. Providing such a test was the second and primary objective of the present study. Thus, three general correlational hypotheses were stated. First, the students over whom teachers felt least control would also be the students most often criticized. Second, the students over whom teachers felt most control were predicted to be the students most often praised. And, finally, the students over whom teachers felt least control would be the students whose work was most often left unevaluated by the teacher.

After classroom behavioral data had been collected, all teachers responded to the Personal Control Questionnaire. This instrument measures the three types of teacher personal control (over subject matter, timing, and duration of an interaction) on separate six-point scales (1 = no control; 6 = total control). In addition, each type of control is measured separately for five classroom interaction situations:

Teacher initiated public interaction with a raised hand, teacher initiated public interaction with no raised hand, student initiated public interaction, teacher initiated private interaction and student initiated private interaction. Teachers responded to the PCQ (a total of 15 questions; 5 situations x three control types) for each of their twelve target students separately.

A multivariate analysis of variance produced significant level of expectation and situation main effects. Table 1 presents the means associated with each dependent variable for each expectation level. Table 2 presents the means associated with these analyses. Univariate analyses of variance for the separate control questions showed that, with regard to expectation levels, all three control questions revealed significant linear effects: as expectation level increased, perceived control of interaction content, timing and duration increased. No curvilinear expectation effects were evidenced.

Control over content and timing showed univariate interaction context effects. Underlying each of these effects was a strong initiator distinction: more control over content and timing was reported for teacher than student initiations. The initiator distinction proved nonsignificant for the duration control questions, though means were in a direction similar to the other control questions. The setting (public/private) distinction was nonsignificant for all three types of control.

Table 3 presents the bivariate relations of general interaction control with the twelve behavior frequencies. For between-class relations, the frequency of only one academic setting was found to significantly covary with control: the less control a teacher reported having over the class the more frequently the teacher initiated interactions in private.

The general pattern in correlations, however, indicated that teachers who felt greater control tended to have more frequent student initiations and less frequent teacher initiations in their classrooms. Greater control also appeared to be related to generally less teacher-student interaction of any sort.

Two notable patterns in control-feedback relations between classrooms were found: teachers reporting the greatest interaction control tended to use no evaluation and criticism most frequently, even when differing frequencies of interactions were controlled. The pattern of correlations, then, indicated a generally positive association between perceived teacher control and the relative occurrence of negative feedback in the classroom.

Table 3 also reveals that none of the four within-classroom control relations involving academic settings proved significant. There was, however, some tendency for students over whom teachers reported greater control to ask relatively fewer questions in private. In addition, while the average correlation did not depart significantly from zero, eleven of the sixteen classrooms revealed negative relations between control and teacher-initiated private interactions. In general, then, there was some indication that high control of a student was associated with relatively less private interaction and possibly more public responding within the classroom.

Behavioral interventions were significantly negatively associated with perceived control and 11 of 16 classrooms also showed a negative relation between procedural interactions and control. The tendency, then, was for greater control over a student to be associated with relatively less nonacademic contact. In addition, relatively more control over a

student was associated with more appropriate responding and less inappropriate responding.

Finally, no feedback frequency was found significantly associated with control differences within classrooms. One trend was evidenced, however. Students over whom teachers' felt greater control were less likely to have initiations go unevaluated.

Discussion

In sum, this study replicated earlier results concerning the effects of initiator, setting, and teacher expectation on teachers' perceptions of interaction control. However, with regard to behavior-control linkages it was found that the direction and magnitude of relations depended heavily upon whether the data referred to variation among teachers or variation among students of the same teacher. In the between-classrooms analyses it was found that teachers who reported more general control tended to have more student initiations and fewer teacher initiations. Within classrooms, the relationship was entirely different, however. Students over whom teachers felt less control tended to interact with the teacher more frequently in private. Regrettably, the correlational nature of the data make any conclusions about causal direction purely conjecture. It is tempting to propose a compensatory-type system at work, however. That is, it may be that teachers gauge their general perception of control over students and then base their level of their active teaching upon it: if general control is high a less initiatory stance is assumed; if general control is low, more active direction of academics occurs. Within classrooms then, student characteristics rather than initiation may play the compensating role, and interaction setting is the dominant control consideration. If the setting tends to be more controllable (private) a less controllable child

is dealt with. Again, this interpretation assumes a causal ordering among the relations which is not tested in the present data and some of the relations appear only weakly. Also, it assumes that public interactions are more controllable than private ones, even though teachers did not report this to be the case.

Finally, and most importantly, relations between feedback and general control also showed directional changes, dependent upon whether classrooms or students within-classrooms were examined. Within classrooms, feedback and control relations were uniformly small; nevertheless, some tentative evidence indicated that lesser control over a student covaried with more frequent ignoring of student responses. Between classrooms, however, use of negative feedback tended to be positively associated with general control. Teachers who felt greater control also tended more frequently to ignore the participation of students in interactions. This result is inconsistent with the model. If, in fact, teachers use greater affect to establish control (which is presumably lacking in the student), this function manifests itself through their relative use of negative feedback within the class, not through their general stylistic decision concerning how much absolute affect to employ.

In general, then, the data indicated that very different processes may be at work, dependent upon whether the teacher's general style or within-classroom deviations from style were focused on. A first contribution of this study is that it highlights the importance of identifying the unit of analysis to which results pertain. In addition, very weak support for the control-feedback link was obtained, and only within-classrooms.

Teacher Perceptions of Personal Control

Gail M. Hinkel

University of Missouri-Columbia

Some Characteristics of the Personal Control Questionnaire

Types of Questions:

Control over interaction 1) content, 2) timing, and 3) duration, gauged on six point scales (1 = no/control 6 = total control). Each type of control is separately reported for five classroom situations (public raised hand/public no hand/child initiated public/teacher initiated private/child initiated private).

Score range:

The questionnaire (containing a total of 15 questions) was completed by the teacher for each student in the class separately, and a student score could range from 15 to 90. The average teacher response was 72.31 (sd = 5.05), or slightly less than "a lot of control."

Administration Date:

November only.

Reliability:

The internal consistency of responses for a given student over all 15 questions was r = .77.

Table 1

Relations of Teacher Expectations to Teacher Interaction Control Perceptions

	Level of Expectation				
Type of Control	High	Average	Low	F^1	p
Subject Matter	5.00	4.91	4.76	10.63	.005
Timing	4.85	4.71	4.66	9.25	.005
Duration	4.90	4.84	4.77	4.73	.05

Note: 1. F-values are for linear expectation effects. No curvilinear effects were found df = 1,32.

Table 2

Teacher Interaction Control Perceptions as a Function of Classroom Situation

	Type of Control		
Classroom Situation	Subject Matter	Timing	Duration
Public with Hands Raised	5.15	4.67	4.90
Public with No Hands	5.10	5.21	4.83
Child Initiation in Public	4.56	4.28	4.80
Teacher Initiation in Private	5.18	5.35	4.91
Child Initiation in Private	4.46	4.18	4.73

Note: 1. For subject matter ($F = 50.93$, df = 1,64, $p<.001$) and timing control ($F = 43.84$, df = 1,64, $p<.001$) teacher initiations are perceived as affording the teacher more control than student initiations.

Table 3

Relations Between Teacher's Perceived Control of Interactions and the Frequency of Observed Classroom Settings and Feedback

Teacher Perception of Interaction Control and Frequency of:	Between Classrooms[1] Correlation	Within Classrooms[2] Average Correlation
Teacher Initiations in Public	-.25	+.07
Teacher Initiations in Private	-.50**	-.08
Student Initiations in Public	+.28	.00
Student Initiations in Private	+.36*	-.14*
Teacher Procedural Initiations	-.32	-.08
Teacher Behavior Interventions	+.03	-.18**
Appropriate Responses	-.26	+.12*
Inappropriate Responses	-.14	-.15*
Total Responses	-.24	-.05
Praise Following an Appropriate Response	-.10	+.03
Criticism Following an Inappropriate Response	+.37*	+.06
No Evaluation Following Any Response	+.37*	-.14*

Notes: 1. Between classroom correlations were based on the teacher's total reported control (averaged over 12 students in her class) and the average observed frequency of setting or feedback per student, N=17.

2. Within classroom average correlations were based on the correlations between a teacher's reported control over each student and the observed frequency of setting or feedback with that student. To derive within classroom probability levels the classroom correlations were converted to Z-scores and the Z-scores were entered into one sample t-tests. For settings df = 16, for feedbacks df = 7 or 8.

* p<.19.
** p<.05.

by Jerry M. Burger

Attribution theories are concerned with how the individual perceives the causes of behavior. Within the classroom setting many attribution researchers have examined the causes which teachers cite for their students' successes and failures and the relationship between these attributions and teacher behavior. Research in this area, most notably by Beckman, has revealed that teacher attributions are influenced by the teacher's perception of the students' general ability level. It has been found that high ability students' successes are generally attributed to ability or stable effort while failure is seen as caused by more external and unstable factors. In contrast, low ability students' successes are often attributed to unstable factors, while their failures are seen as reflecting more stable attributes. This means that for low ability students positive performance does not necessarily increase a teacher's future expectation for success, while failure may lower estimates of future success. This pattern was referred to by Weiner in 1976 as the "low expectancy cycle." One purpose of our investigation was to examine this low expectancy cycle within a field setting.

A second purpose for examining teacher attributions was to relate them to the teachers' use of praise and criticism, or affective feedback. We wanted to compare the results of laboratory experiments in this area with those found in field research. Controlled experiments examining the teacher attribution-feedback relationship have typically employed subjects who are asked to pretend they are teachers and to provide evaluative feedback to hypothetical students in various hypothetical situations. This research has typically found that effort attributions lead to greater use of affective feedback. In particular, low ability students whose successes are attributed to high effort are highly rewarded.

Recently, Cooper has introduced an expanded attributional model for teacher feedback which includes the notion of personal control. According to this model, a teacher's first priority within a real classroom setting may be to employ a feedback strategy that satisfies the teacher's desire for control over classroom events. Use of feedback to reflect student effort may emerge only after control is satisfactorily established. Because such control may be more difficult to establish with poorer students, teachers may avoid praising strong efforts from them. Such praise may encourage future low control initiations. Feedback to high ability students, on the other hand, may be more related to expended effort, because teachers anticipate greater control over these students' future initiations.

The present investigation provides an actual classroom context within which to examine the relationship between teacher attributions, teacher expectancies and teacher feedback to the student. It provides an excellent opportunity to test the "differential contingency hypothesis," which is not easily examined within laboratory experiments.

METHOD

To assessteachers' attributions of students' successes and failures, each teacher was given an open-ended attribution questionnaire immediately following each of the three observation periods. This questionnaire called for the teacher's attributions for successful and unsuccessful academic performances by each of the 12 target students. Teachers were asked to list each reason and then provide the percentage of time this reason applied to the student's performance.

Teacher responses to the questionnaires were then placed into one of

12 attribution categories, according to a coding scheme developed by Cooper and Burger (in press). The twelve categories can be found on page 13 of the handout. The questionnaire responses were categorized by two scorers who were kept blind as to the student's ability level.

RESULTS

We began our analyses by examining the relationship between the teacher's level of expectation for the student, the time of year, and the percentage of the causal attribution citation. The 12 attribution categories were first subjected to multivariate analyses of variance grouped by internal stable, effort related and external causes. Only those effects which produced significant multivariate F values were examined with univariate F tests. As Table 1 in the handout reveals, significant linear effects were found for four of the original 12 categories. Higher expectations were associated with more immediate effort and family citations as causes of academic performance. In addition, the lower the expectation level, the more likely attention and the task were cited as the performance cause.

Table 2 examines the relationship between attribution citation and level of expectation when performance outcome is included in the analysis. As can be seen in the table, ability, acquired characteristics, and stable effort were most often seen as causes of high expectation students' successes and of low expectation students' failures. The significant effect found for the subject matter category may be due primarily to the failure condition. Teachers tended to cite a lack of interest in the subject matter as a cause of high students' failures more often than of low student's failures. Finally, good directions and instruction was cited most often

when lows succeeded and bad directions and instructions were cited most often when highs failed.

Other analyses conducted on the data can be found in Tables 3 through 5. Time does not permit a detailed examination of these data here, so interested individuals can examine these tables at their convenience.

Next, the relations between teacher attributions and the teacher's use of praise and criticism in the classroom was examined. In the manner described by Sherry Blakey, the feedback measures were created by residualizing the praise and criticism scores using the frequency of appropriate and inappropriate responses as predictors. When no examples of praise or criticism were found in a classroom during a particular observation period, that classroom was dropped from the within-class analyses. The praise and criticism measures were then related to three attribution categories, internal stable, effort related and external. Individual attributions were collapsed to increase variability in teacher citations. In all cases praise is related to success attributions and criticism to failure attributions. The correlations between these variables by time of the school year are presented in Tables 6 and 7. Table 6 presents the between-classroom relations, while Table 7 provides the within-classroom findings.

Turning first to Table 6, it can be seen that no significant relations were found between a teacherb average use of praise and average causal category citation. This was true for all three observation periods. However, a consistent pattern across time can be found in these data, suggesting that a teacher's amount of praising is generally positively related to her citation of internal stable causes for students' successes, and negatively related with the citation of external causes of success. On the other hand, several significant effects were found for the criticism

measure. In November, teachers who perceived their student's failures as most often caused by a lack of ability, or some other stable student attribute, were most likely to criticize a given inappropriate response. Average use of criticism was also positively related to teacher citation of effort causes and negatively related to external causes. While this same general pattern was found for the effort and external attributions in the February sample, the internal stable attribution relationship with criticism was reversed. By the May sample, any relationship between the three attribution dimensions and criticism had virtually disappeared.

Table 7 presents the attribution citiation-affective feedback relationships for the within-classroom analysis. As has been found earlier, the within-classroom analysis provides results dramatically different from those obtained with the between-classroom approach. In this table we are examining the feedback to and attributions for particular students in relation to their classmates. As can be seen in Table 7, there appears to be little relation between the teacher's citation of internal stable and effort-related causes for success and the relative frequency with which the student gets praised. However, a positive relationship between the attribution of success to external causes and the use of praise does seem to emerge. Students whose successes tend to be more externally caused relative to their classmates also tend to receive more praise. A subsequent breakdown of these relationships into the four causal catagories which make up the external dimension revealed that the attributions of task and directions underlie the effect. Thus, students who were seen as succeeding because they performed at appropriate tasks and followed directions were rewarded with more frequent praise than were those whose performances were

seen as caused by other factors.

In examining the relationship between criticism and attributions, criticism appears to decrease as the teacher perceives internal stable causes for the students' failures, and again appears to increase as the teacher perceives external causes of the failure. While a significant negative relation between criticism and effort-related attributions did emerge in the Febraury sample, the small positive relationships found for the other two observation periods make the conclusions drawn about this relationship somewhat nebulous. Again, an informal analysis of the four external attributions revealed relatively more criticism went to students whose failures were seen as do to inappropriate tasks or not following directions.

Finally, Table 8 presents the average within-classroom partial correlations between effort-related causal attributions and residualized praise for high and low expectation students separately. For this analysis, the high expectation group was comprised of the six students with the highest absolute expectation rankings within each classroom, while the six lowest-ranked students constituted the low expectation group. Praise and feedback were correlated with one another for each expectation group separately within each class. As can be seen in the table, the general pattern which emerges suggests that high expectation students are more often praised for effort-attributed successes than are low expectation students. It is important to note that, once again, the pattern emerges most strongly in November. Criticism was not analyzed in this manner because of its low incidence.

DISCUSSION

Let me briefly now point out a few of the numerous findings which emerged from this set of data. First, the low expectancy cycle was substantiated here, as we found low expectation students' successes attributed to external causes while their failures were attributed to internal causes. Second, only limited evidence was found in our real academic setting for the typical laboratory finding of a positive relation between effort citation and feedback. Specifically, only in relation to total class differences did a strong effort citation-criticism relation emerge. Within classrooms, on the other hand, an unexpected positive relationship was found between both praise and criticism and the citation of external causes of student performances. We found some indication that students following directions and working at appropriate tasks were most likely to be praised, while students not following directions or working on inappropriate tasks were most likely to be criticized. These results can be interpreted in support of the notion that teacher perceptions of control and their affective feedback to the student are related. Finally, the differential contingency hypothesis received only weak support. It seemed some distinction in the relation between effort citations and praise for high and low expectation students was found in November. However, only nonsignificant, but directionally supportive, relations were found in the other two observation periods. In summary, it seems fair to conclude that our data once again point to the importance of examining teacher attributions when examining the link between student performance and teacher feedback in the classroom.

Teachers as Attributors of Student Performance

Jerry M. Burger

Some Properties of the Attribution Measure

Type of Questions:

Open-ended responses to the question "when this student (succeeds/fails) at an academic task, what is (are) the reason(s) for this occurrence?" The percentage of time a particular cause was relevent was then estimated.

Administration Dates:

November, February and May.

Coding System:

Responses were coded, according to the Cooper and Burger (in press) system, into one of twelve categories:

ability
previous experience
acquired characteristics (habits, attitudes)
stable effort
interest in the subject matter
immediate effort
attention
physiological processes (mood, health)
directions or instruction
the task
family background
other students

Score Range:

Attributions were collected for success and failure separately and for each student separately. Percentages for each category could range from 0 to 100.

Reliability of Coding:

November k = .89.
February k = .77.
May k = .86.

Measurement Creation:

Three attribution measures were created, for success and failure separately, to relate to behaviors:

1) % of internal stable attributions = ability + previous experience + acquired characteristics.
2) % of effort-related attributions = stable effort + interest in the subject matter + immediate effort + attention.
3) % of external attributions = directions or instruction + task + family background + other students.

Table 1

Relations of Level of Expectation and Percentage of Causal Attribution Citations

	Level of Expectation				
Attribution	High	Average	Low	F[1]	P
Immediate Effort	22.1	21.9	18.5	4.96	.04
Attention	10.5	14.1	14.7	4.56	.04
Task	3.3	7.3	11.1	7.67	.01
Family	1.5	1.0	0.5	4.54	.05

Notes: 1. F-values are for linear expectation effects. No curvilinear effects were found. df = 1,30.

Table 2

Relations of Causal Attribution Citations to Level of Expectation in Interaction with Performance Outcome

	Performance Outcome					
	Success			Failure		
Attribution	High	Average	Low	High	Average	Low
Ability (.001)[1]	23.0	20.1	10.7	2.8	4.8	10.7
Acquired Characteristics (.02)	13.3	13.3	7.9	4.7	7.7	12.5
Stable Effort (.04)	16.1	12.6	12.7	2.0	3.5	4.1
Subject Matter (.02)	7.2	8.1	7.3	5.7	4.5	1.7
Directions and Instructions (.006)	2.6	5.6	14.0	16.3	12.2	10.4

Note: 1. p-levels for each attribution are presented in parentheses. df = 2,30.

Table 3

Relations of Performance Outcome and Percentage of Causal Attribution Citations

Attribution	Performance Outcome: Success	Failure	F	P
Ability	17.9	6.1	9.53	.001
Stable Effort	13.8	3.2	16.98	.001
Subject Matter	7.5	4.0	4.19	.06
Immediate Effort	16.6	25.1	10.90	.005
Attention	10.2	16.0	6.85	.02
Directions and Instruction	7.4	13.0	15.72	.002
Other Students	2.0	4.1	3.92	.07

Notes: df = 1,15.

Table 4

Relations of Time of School Year and Percentage of Causal Attribution Citations

Attribution	Time of School Year: October	February	May	F[1]	P
Ability	13.7	13.3	8.9	4.85	.04
Acquired Characteristics	7.7	9.7	14.8	11.45	.002

Notes: 1. F-values are for linear time of year effects. No curvilinear effects were found. df = 1,30.

Table 5

Relations of Causal Attribution Citations to Performance Outcome In Interaction with Time of School Year

Attribution	Performance Outcome: Success			Failure		
	Oct.	Feb.	May	Oct.	Feb.	May
Ability (.02)[1]	21.3	19.7	12.8	6.2	7.0	5.0
Task (.03)	4.5	4.4	8.9	11.7	4.1	9.7

Notes:
1. p-levels for each attribution are presented in parentheses. df = 2,30.

Table 6

Between-Classroom Relations of Causes for Performance and the Frequency of Affective Feedback

Percent of Performance Outcomes Attributed to[2]:	Time	Type of Affective Feedback[1]: Praise Following Appropriate Responses	Criticism Following Inappropriate Response
Internal Stable Causes	November	+.36	+.63**
	February	+.11	-.58*
	May	+.13	-.11
Effort-Related Causes	November	-.19	+.63**
	February	-.00	+.54*
	May	-.00	+.00
External Causes	November	-.25	-.46*
	February	-.10	-.25
	May	-.16	-.00

Notes:

1. To create the praise and criticism measures, the average frequency of praise and criticism in each classroom was residualized by the classroom's average frequency of appropriate or inappropriate responding. As such, measures represent the relative frequency of affect, given equal responding rates across classrooms.

2. This measure is the average percent of citations of each causal category by the teacher. Praise is related to causal citations for success and criticism is related to causal citations for failure. N = 15 or 16.

* p<.13
** p<.04

Table 7

Average Within Classroom Relations of Causes for Performance and the Frequency of Affective Feedback

Percent of Performance Outcomes Attributed to[2]:	Time	Type of Affective Feedback[1]: Praise Following Appropriate Responses	Criticism Following Inappropriate Respons
Internal Stable Causes	November	+.04	-.17**
	February	-.12*	-.11*
	May	-.05	-.08*
Effect-Related Causes	November	-.04	+.05
	February	+.02	-.30**
	May	-.01	+.01
External Causes	November	+.08*	+.09
	February	+.13**	+.31**
	May	+.09	+.14*

Notes:

1. To create the praise and criticism measures, the frequency of praise and criticism received by each student was residualized by the student's appropriate or inappropriate responding. Residualization was carried out for each class separately. As such, feedback measures represent a student's relative receiving of affect from the teacher given equal responding rates within the class.

2. This measure is the percent of citation of each causal category for each student in the class. Percent citation and residualized feedback were correlated for each classroom separately. The average correlation for the sample of classrooms is presented. N = 12 to 16 for praise and 7 or 8 for criticism.

* $p<.19$

** $p<.03$

Table 8

Average Within-Classroom Correlations Between Effort-Related Causal Attributions and Praise for High and Low Expectation Students Separately

	Expectation Level[1]		
Time of Year	High	Low	p-level of difference[1]
November	+.05	-.11	.05
February	+.01	-.03	--
May	+.06	-.02	--

Notes:

1. Students within each classroom were divided into two expectation groups based on a mean split. Correlations between the teacher's percent of effort-related causal citations for the student and the students residualized praise were then computed for each expectation group separately. The two correlations within each class were then converted to Z-scores before inference testing.

2. p-levels are based on paired observation t-tests, one-tailed. November N = 16; February N = 11; May N = 15.

Student Perceptions of Personal Control

John Sterling

There has been much speculation that beliefs concerning internal versus external control of events are related to achievement motivation and may be important antecedents to positive performance in school. For instance, numerous studies show that students who percieve their efforts as controlling their outcomes are higher in achievement motivation. While some have investigated the family background roots of locus of control, only recently have researchers begun to look for antecedents in the classroom itself. One instance of such theorizing is Dweck's speculation on how differences in control beliefs between males and females can be generated by differing classroom behavior patterns.

Of particular interest here is that the expectation communication model proposes that teachers may structure rewards for high expectation students more contingent on effort than for low expectation students. If this is so, and Jerry's paper provides some evidence that it is, then we would expect to find that low expectation students percieve less effort-outcome covariation than high expectation students and, perhaps, see themselves as generally less responsible for success and failure.

We might further predict that since as the use of criticism increases the contingency behind it may more frequently become teacher control, students who recieve the most criticism may

also feel the least effort-outcome covariation. These two hypotheses formed the major rationale behind this paper. On an exploratory level, however, we were interested in examining how locus of control beliefs relate to time of school year and how effort-outcome covariation beliefs relate to other classroom behaviors.

In order to examine these questions the Intellectual Achievement Responsibility scale was administered to all 204 students in our sample, in both September and May. The IAR asks 34 forced choice questions concerning the causes of personal academic outcomes. For example, one question on the IAR reads, "When you learn something quickly in school is it usually (a) because you paid close attention, or (b) because the teacher explained it clearly?". Responses can be summed to form internality for success, internality for failure and effort subscales. Internality for success and failure scores can range from 0 to 17, with 17 equal to the greatest internality. Effort-outcome covariation can range from 0 to 16, with 16 meaning effort is always cited as the cause.

Internal consistency estimates for both September and May were comparable to those reported by the scales authors.

Table 1 of your handout presents the relationship between teacher expectation and the three IAR subscales. A significant multivariate analysis of variance for the expectation main effect

was found and underlying univariate analyses of variance were performed. These revealed that student responses on all three subscales were positively linearly related to level of teacher expectation. In the case of failure the univariate expectation effect was significant. In genereal, then, it was found that higher expectation students took more personal responsibility for their academic outcomes.

A significant multivariate analysis of variance effect was also found for student gender. Table 2 presents the relevant underlying means. The underlying univariate analysis revealed significantly higher responsibility taken for success by females than males. A trend also indicated that females tended to percieve more effort-outcome covariation than males. No significant effects were found involving the time of the school year.

Table 3 presents the between- and within-classroom correlations involving the effort-outcome covariation scale and eleven of our classroom behavior measures.

First, examining the between classroom correlations, we found that in both September and May teacher initiations in public and average student effort-outcome beliefs were related: In classrooms where the teacher made more frequent public initiations, the classrooms' average belief that effort produced outcomes was also higher. When academic initiations in general are examined, it appeared that, in September, more teacher initiating and less

student initiating went on in classrooms with stronger effort-outcome covariation beliefs. By May, however, it appeared that setting and not initiator is crucial. It was found that classrooms with the most public and the least private responding, regardless of initiator, are also the classrooms with the highest effort-outcome covariation beliefs.

Turning to non-academic interactions we found that, in May, in classrooms with more behavioral interventions the students expressed the lower effort-outcome beliefs. High effort-outcome classrooms also tended to have generally more student responding, especially appropriate responding. Finally, between classrooms it was found, especially in May, that more relative criticism in a classroom was associated with less effort-outcome belief on the part of class members.

Turning to within classroom relations, the September analyses produced several reliable effort-outcome belief and academic interaction associations. Within classrooms, setting again seemed to be the most important variable; students doing the most public responding and the least private responding evidenced higher effort-outcome beliefs than their classmates. In May, high effort-outcome belief students exhibited relatively more procedural question asking. As with the between analysis, relatively high effort-outcome belief students did generally more responding, especially appropriate responding. And finally, no residualized

feedback measure produced a significant relation with effort-outcome beliefs. However, criticism following inapropriate responses was strongly negatively related to student effort-outcome belief in September.

In relation to the predictions then, qualified support was found. The prediction that expectations and effort-outcome beliefs would be positively linearly related was supported, though the effect was not strong.

The prediction that effort-outcome beliefs and criticism would be negatively related was supported between classrooms. Within classrooms, however, where the model is believed to be the most relevant, the relation may be evidenced only in September. Finally, it might also be noted that the relation uncovered here between gender and locus of control, was opposite to that assumed by others. That is, we found females to have slightly higher effort-outcome beliefs and generally higher personal control beliefs than boys. This evidence is contrary to that presented by Dweck and Reppucci in 1973.

To conclude, the data supported the prediction that expectation and effort-outcome beliefs are positively related, though the relation is not strong, especially within the classroom.

Student Perceptions of Personal Control

John Sterling

Some Characteristics of the Intellectual-Achievement Responsibility Scale

Types of Questions:

The IAR asks 34 forced choice questions concerning the causes of academic outcomes. For each question, which presents a hypothetical academic situation, one possible response cites an internal cause and the other cites a significant other as cause.

Administration Dates:

September and May.

Measurement Creation:

Responses can be summed to form internality for success, internality for failure and effort-outcome covariation subscales.

Score Range:

Internality for success and failure scores can range from 0 to 17 (17 = greatest internality). Effort-outcome covariation can range from 0 to 16 (16 = effort is always the cause).

Reliability:

Success subscale internal consistency = .46 in September and .56 in May.

Failure subscale internal consistency = .65 in September and .68 in May.

Effort-Outcome Covariation subscale internal consistency = .61 in September and .61 in May.

These reliabilities are comparable to those reported by the instruments authors (Crandall, et. al., 1965).

Table 1

Relations Between Teacher Expectations and Student

IAR Subscale Response

	Level of Expectation				
Subscale	High	Average	Low	F^1	P
Success	13.87	13.52	13.19	3.20	.09
Failure	11.01	11.02	10.07	6.62	.02
Effort	11.82	11.72	11.31	1.28	--

Notes: 1. F-values are for linear expectation effects. No curvilinear effects were found. df = 1,30. The MANOVA F-value associated with this effect was 3.06, df = 6,56, p<.012.

Table 2

Relations Between Student Gender and Student

IAR Subscale Responses

	Student Gender			
Subscale	Female	Male	F	P
Success	13.74	13.29	7.49	.02
Failure	10.79	10.61	<1	--
Effort	11.83	11.45	2.56	.13

Notes: df = 1,15. The MANOVA F-value associated with this effect was 3.34, df = 3,13, p<.053.

Table 3

Relations of Student Effort-Outcome Covariation Beliefs and the Frequency of Classroom Settings and Feedbacks

Student Effort-Outcome Covariation Beliefs and Frequency of	Between-Classrooms Correlations[1]		Within-Classrooms Average Correlation[2]	
	September	May	September	May
Teacher Initiations in Public	+.37*	+.38*	+.13**	+.09
Teacher Initiations in Private	+.12	-.04	-.12**	+.04
Student Initiations in Public	-.23	+.18	+.07**	-.01
Student Initiations in Private	-.05	-.22	-.02	+.08
Student Procedural Interactions	+.03	+.03	-.03	+.17*
Teacher Behavioral Interventions	+.23	-.22	-.08	+.04
Appropriate Responses	+.28	+.37*	+.11*	+.09
Inappropriate Responses	+.25	+.20	-.01	+.04
Praise Following an Appropriate Response	-.00	-.22	-.01	+.05
Criticism Following an Inappropriate Response	-.26	-.56**	-.11	+.07
No Evaluation Following Any Response	-.11	+.06	-.07	+.02

Notes: 1. Between-classroom correlations were based on the average student effort-outcome covariation in a class and the average frequency of the setting or feedback. N = 16 for both September and May.

2. Within-classroom average correlations were based on the correlations between student's effort-outcome covariation and their frequency of setting or feedback for each class separately. To derive within-classroom probability levels the classroom correlations were converted to Z-scores and the Z-scores were entered into one sample t-tests. For settings df = 16, for feedbacks, df = 7 to 13.

* p<.19.
** p<.05.

Studying and Modifying Classroom Behavior

Thomas L. Good

University of Missouri--Columbia

My role in the symposium is to provide a brief, internal critique of the progress and limitations that the program of research has experienced. Also, I want to comment upon some of the future goals that the research team will pursue this year.

However, prior to presenting the critique and a description of next year's research, I would like to make a few positive comments about the research described in the preceding papers. My general impression is that the data are a rich source of information which provide evidence that is reasonably consistent with the model that was used for organizing the research and which was described in Harris Cooper's paper.

Data were not collected in reading or mathematics and these are the areas that appear to be most salient to both teachers and students. It appears to be the case that most educators stress the importance of reading and mathematics in the elementary school years. Indeed, in the school district in which the data were collected students are assigned grades in certain subjects (reading, language, spelling and mathematics), but in other subjects pupils receive only checks (handwriting, science, social studies, and art). Such differential grading practices may be associated with different pupil perceptions of importance. Given that teachers may attribute more importance to mathematics and reading, it would seem reasonable to contend that the sharpest degree of differential teacher behavior toward high and low students would occur in those subjects.

Although it is problematic to argue that linkages between teacher cognition and behavior might have been more pronounced in reading or mathematics than in language arts or social studies (subjects observed in our study), it is the case that differential

teacher behavior toward students perceived to be high and low achievers were obtained. We feel that behavioral support for the theoretical model in non-core subjects provides a more rigorous test of the plausibility of the model.

Data have existed for some time to document the fact that some teachers differentiate in their behavior toward high and low students. Results reported in Sherry Blakey's paper illustrate that it was possible to replicate this finding even in "marginal" subject areas. Thus, it does not appear to be the case that teachers pay more attention to lows in less important subject areas (where, hypothetically, there might be less pressure on teachers to get the right answer, maintain momentum, etc.). Indeed, there is ample evidence to support the contention that the average high student appears to receive feedback that is superior (both quantitatively and qualitatively) to that obtained by the average low student.

Individual Differences

It is important to note that the data reported in Sherry's paper describe relationships that were obtained for the entire sample of teachers. Our informal examination of data from individual classrooms suggests that differential teaching behavior toward high and low students was present in only some classrooms. Hence, this research, like previous studies (e.g. Brophy and Good, 1974), illustrates that differential teaching behavior is a common, but not universal, finding. This important qualification needs to be recognized.

Also, it is important to build upon this finding in subsequent data analyses. It will be important for us to examine classrooms where differential teaching behavior was observed to see what patterns of relationships emerge in this sample. Is it the

case that more polarization occurs in these classrooms than was found in the sample as a whole? That is, do low students in these classrooms approach their teachers less in the spring than they did in the fall (or approach their teachers less in the spring relative to other low students who were in rooms where differential teaching was not evidenced in the spring)?

Similarly, it is possible that teachers' attributions or students' attributions in this sample of classrooms differ from the general pattern of findings reported in the papers by Jerry Burger and John Sterling. We anticipate conducting several follow-up studies to explore such possibilities.

Teacher Cognition--Teacher Behavior

Given that differential teaching behavior was evidenced in some classrooms, it was possible to explore the linkage between teacher cognition and behavior. Gail Hinkel's paper examined the relationship between a measure of teachers' personal control and classroom behavior. The data she reports reveals some support for this relationship but the evidence is far from compelling.

Several important qualifications need to be expressed. First, the personal control measure is only one teacher belief or cognition that may influence classroom teaching. Many beliefs may mediate the personal control-behavior link. To cite but two, I suggest these as plausible mechanisms: (1) Teachers' beliefs about personal efficacy and (2) teachers' beliefs about the socioemotional impact of their behavior on students.

Teachers who feel that the classroom behavior and performance of lows are modifiable and those who feel that the learning performance of lows is largely beyond their immediate control

may behave differently in the classroom, even though their personal control beliefs are similar. Similarly, teachers' behavior may be influenced by their beliefs about the social needs of individual students.

As a case in point, one teacher in the debriefing session indicated that she didn't stay with lows after an incorrect response because she didn't want to embarrass students. Teachers who believe that students will be embarrassed (and subsequent motivation for performance lowered) if they stay with them and work for a successful response may be less likely to stay with lows even though their personal control needs are low.

Given the percent of variance explained by the personal control belief measure, it seems reasonable to believe that more statistically significant results would have been produced if other teacher beliefs had been measured. In our subsequent research, we anticipate the development and use of a teacher efficacy measure.

It should also be noted that teachers in this sample were all experienced teachers. It is possible that first and second year teachers would exhibit stronger personal control-behavior relationships than were evidenced in this study. This reasoning is based upon Fuller's (1969) developmental theory of teaching. Fuller has contended that beginning teachers are more concerned with self and control ("Can I control students?" "Will I be liked?") than are experienced teachers. She suggests that teachers progressively become more concerned with student learning.

Whether or not better relationships between the personal control measure and classroom behavior would be found with a

sample of relatively inexperienced teachers is an empirical question. It is also possible that stronger correlations might be obtained in schools where managerial issues are more salient (because of greater variations in the student population) than was the case in this sample of "middle class" schools. The linkage between teacher cognition and classroom behavior obtained in this sample was disappointing. However when one considers the history of social psychological attempts to link beliefs and behaviors, the present results can be seen as somewhat encouraging.

Within and Between Classroom Analyses

Ironically, it was found that in many cases larger correlations were obtained when data were analyzed with a between strategy than when a within classroom model was employed. Obviously, our research model was largely motivated by our interest in within classroom variations in teacher behavior. However, as Harris pointed out in his overview paper, we have become interested in both within and between sources of variation and the data reported here enhance this interest.

Perhaps the personal control measure of teacher thinking and behavior as proxied by the teacher personal control measure is more sensitive to differences between teachers than other belief measures (e.g., a measure of efficacy might be more sensitive to within classroom variations). However, the importance of between classroom differences is also illustrated by the findings reported in Jerry Burger's paper. Data found in the recent teacher effectiveness literature (e.g. Good, 1979; Good and Grouws, 1979; Brophy and Evertson, 1976) also illustrate the power of between classroom data analysis models.

Only subsequent research will help us to explore the circumstances under which either model will produce more sensitive and more appropriate analysis. It is probably the case that there was less variance in student characteristics (e.g. aptitude, socio-economic status, and so forth) in our sample than in other teacher expectation studies. As the variance in student characteristics within the sample of classrooms increases, it may be that greater differences in teacher behavior within classrooms occur and hence more powerful results are obtained through the use of within data analysis strategies.

Again, it is the case that a more coherent picture will emerge only with more research and conceptual interpretations of such findings. Still, the present data suggest that at least for some data different patterns and implications are suggested by the between and within models. It would seem fruitful for future investigators to use both strategies in examining and reporting their findings.

Teacher Behavior Toward the Entire Class

A potential weakness of this study and a weakness that marks most teacher expectation studies is the fact that only teacher behavior that was expressed to individual students was coded. This orientation is understandable, given that teacher expectation studies have been designed to uncover within classroom variation in teacher behavior (i.e. differential behavior toward high and low students). Because of the notable differences in teacher behavior across classrooms uncovered in this study, it appears important to study sources of teacher expectations that may be communicated to the whole class or to groups of students.

The work of Weinstein (1976) provides an empirical illustration of the possible benefits of examining teacher behavior toward the class generally or to subgroups of students. She reports that some teachers may inadvertently erode the performance of some groups by the way they publically refer to the "better" groups. She suggests that comments like "Joey's group has all of this to do because they are very smart and this is more difficult" may help to sensitize students to their differential potential and to lower the effort of certain students.

In future work, we want to attempt to accommodate such possibilities by coding general teacher comments as well as their expressions to individual students. Obviously, it is impossible to study all forms of classroom communication in a single research project, and the attempt to assess comprehensively all dimensions may result in poor and incomplete measurement of any single aspect. Still, it may be possible to increase the robustness of observational measures by sampling teacher behaviors toward individuals, student groups, and entire classes in the same study.

Student Mediation

I have previously mentioned some problems with teacher and observational instrumentation. Another limitation of the present study is imposed by the research instrument that was utilized to tap student responses. Although the IAR provides a useful "shadow" of student beliefs about their control of learning outcomes, it appears relatively pale alongside the rich complexity of beliefs and strategies that may motivate student classroom behavior.

A glimpse of possible student motivation that may not be mirrored in "IAR-like" instruments appears in the following quote from Sheperd (1973):

> Me and Schwartz and Koczniewski sat so far back in the classroom that the blackboard was only a vague rumor to us. Miss Schields was a shifting figure in the haze on the distant horizon, her voice a faint but ominous drone punctuated by squeaking chalk. Within a short time I became adept at reading the inflection, if not the content, of those far-off sounds, sensing instantly when danger was looming. Danger meant simply being called on. Kids in the front of the classroom didn't know the meaning of danger. Ace test takers, they loved nothing more than to display their immense knowledge by waving their hands frantically even before questions were asked. Today, when I think of the classrooms of my youth, I see a forest of waving hands between me and the teacher. They were the smartasses who went on to become corporation presidents, TV talk-show guests and owners of cabin cruisers.
>
> I made it a point to wear bland-colored clothes, the better to blend into the background. I learned to weave my body from side to side, dropping a shoulder here, shifting my neck a few degrees to the right there, with the crucial object in mind of always keeping a line of kids between me and the teacher's eagle eye.
>
> For those rare but inevitable occasions--say, during a chicken-pox epidemic--when the ranks in the rows ahead were too thin to provide adequate cover, I practiced the vacant-eyeball ploy, which has since become a popular device for junior executives the world over who cannot afford to be nailed by their seniors in sales conferences and other perilous situations. The vacant eyeball appears to be looking attentively but, in fact, sees nothing. It is a blank mirror of anonymity. I learned early in the game that if they don't catch your eye, they don't call on you. Combined with a fixed facial expression of deadpan alertness--neither too deadpan nor too alert—this technique has been known to render its practitioner virtually invisible. (p. 144)

It may be that student learning is affected not only by observable teacher behavior but also by the interpretation that students assign to given teacher behaviors. That students' effort-outcome perceptions do not have higher relationships with identifiable forms of teacher behavior may be in part due to the fact that certain patterns of interaction with the teacher mean different things to different students.

One of the common assumptions made by teacher expectation writers is that teachers selectively perceive and interpret student behavior. However, as I have noted elsewhere (Good, in press),

students also are likely to interpret teachers' classroom behavior selectively. Students who feel that teachers ask questions to provide students a chance to talk and/or allow the teacher to fill time may respond with different levels of attention and effort than the student who feels that he or she is being judged. Hence, critical teacher feedback about incorrect responses may bother students who perceive that they are being judged, but be irrelevant to students who feel that teachers ask questions only to fill time.

It is possible to argue that various student traits may be associated with their perception of classroom events. Braun (1976) has argued that children who possess a high self-concept may be less susceptible to teacher expectation effects. Presumably, such self views may mediate how students perceive and/or react to teacher behavior. Very little is known about student views of classroom events, although there are some encouraging signs of research interest in this topic (Weinstein & Middlestadt, in press; Doyle, 1978; Stipek, 1977; Winne and Marx, 1977; Nash, 1973).

Although the issues surrounding student mediation hypotheses are complex and involve numerous methodological problems, the possible payoff from integrating such perspectives more fully into classroom work on teacher expectancy effects is intriguing. The model we used in last year's research made some attempt in this direction by using the IAR as a proxy for assessing students' views of the classroom. We hope to enhance our effort in this year's research effort by measuring students' sensitivity to nonverbal classroom cues (Rosenthal et al., 1979).

Another attempt to explore students' perceptions of classroom events was included this past year. In particular, we asked students to complete a questionnaire that asked them to indicate the various

frequencies of teacher behavior that they received relative to classmates. Questions were written to parallel many of the observation measures that were collected by observers (e.g. in relation to other students in the classroom does your teacher call on you more often, about the same, or less than other students?). Teachers were also asked to respond to this questionnaire for each target student. It will thus be possible for us to assess students' perceptions of certain classroom events and to compare their assessments with those of classroom teachers as well as classroom coders. The congruence (or lack thereof) between students, teachers, and observers represents an interesting issue. Available evidence suggests that "witnesses" of classroom drama may very well see different "plays" (e.g. Hook and Rosenshine, 1979).

We also see the measurement of student perceptions as an interesting form of a validity check on the model. If students do not perceive differential teacher behavior, then certain explanations of a teacher expectation model (the social psychological) would appear to become more difficult to argue. That is, if students do not perceive differential teacher behavior, then it may be that differences in student achievement which can be associated with teacher behavior are direct, and not indirect, effects. As I have noted elsewhere (Good, in press) certain "achievement effects" may be due to the fact that some students receive fewer opportunities to respond and less practice not because their motivation for school work is eroded.

I suspect that student performance is influenced both directly by what teachers do (a well-managed classroom may generally have positive effects on student learning no matter what inferences students make as to why teachers have created certain

classroom structures) as well as students' perceptions of teacher behavior (student beliefs mediate some, but not all, teaching practices). Obviously, our attempt to measure student perceptions is far from complete (we have measured only students' estimates of certain teacher behaviors; missing is information about the significance, if any, that students attach to such behavior patterns). However, we are attempting to integrate some novel aspects of student mediation into our research paradigm.

Student Achievement Measures

Another limitation of the present study is that no student achievement measures were collected. If one believes that schools should have some effect upon students (other than a pleasant consumatory effect), it is obviously important to assess the effects of classroom practices upon student achievement, attitude, or some other form of criterial evidence. It is easy to become absorbed with the "obvious" deficiencies in classroom processes. However, the history of educational practice is filled with shibboleths that have been sold as truths but rapidly turn out to be poor ideas when tested with research.

A variety of problems (time, resources, appropriate permissions) prevented the collection of achievement measures; however, we plan to include pre and post achievement testing in our research this year. Although it is tempting to speculate that certain classroom practices may enhance or erode achievement, our data presented in this symposium cannot respond to this issue directly. Hopefully, our follow-up research will be able to clarify the effects of teacher and student cognitions, and classroom behavior on student outcomes other than classroom process measures (i.e. we do have process "outcomes" in this year's data . . . student initiation rates and so forth). As a case in point, it may be that the teacher's impulse to avoid

"embarrassing the students" has some validity. Although we suspect this is not the case, only subsequent research will verify the plausibility of this contention and related hypotheses.

Modifying Classroom Behavior

The research reported in the preceding papers has conveyed what we have studied this year, why we did so, and our findings. In the next few weeks, we will be discussing and analyzing this information in the attempt to build a treatment program designed to modify classroom behavior. The substance of the treatment program is impossible to specify because we are in the midst of building it. In brief, it is possible to say that the training procedures will help to sensitize teachers to possible beliefs and behaviors that may reduce the opportunity and motivation of low students. That is, we hope to help teachers to explore ways in which students' beliefs in effort-outcome covariations can be strengthened by altering certain classroom practices.

The procedures for training teachers are not clear at this time and the task is a large one. Given that the treatment we ultimately develop will be problematic in terms of its effectiveness, participating teachers will have a chance to alter the treatment program we design. Once the problem has been clarified, perhaps teachers will be able to assist the calibration of the treatment in important ways.

In testing the effects of the treatment, we plan to use three groups of teachers. One group of teachers will receive information abo . teacher expectation and attributions drawn from extant literature. These teachers will thus become aware of certain practices that appear to be detrimental to the performance of students,

but they will not receive specific advice about how to resolve the problem. A second group of teachers will receive information and specific advice. Again, these teachers will have a chance to modify the program in terms of their insights and experience. A third group will be used as a traditional control group.

Many of the analyses reported in this symposium will be repeated next year, along with an examination of the treatment effects. Among the new questions and analyses that will be conducted next year are the following: (1) Do teachers implement the treatment?; (2) Do teachers show radiation effects (i.e., alter their behavior in ways not called for in the treatment . . . see Good and Brophy, 1974, for previous empirical work on this question)?; (3) What are the effects of the treatment on student beliefs, behavior, and achievement?; and (4) What strategies do teachers in the information only group attempt to employ and how do these strategies compare with those used by the experimental teachers?

In closing, I believe that the program of classroom research reviewed here has provided a rich source of data that appears to have potential value for educators. The data collected in this project may provide an objective base for helping teachers to examine their own performances, their consequence, and give them an opportunity to reflect upon observed behaviors in terms of intended performance outcome. The assumption is that teachers (like practitioners in any field) are not fully aware of what they do, and of the possibility that their behavior may be somewhat different than their own standards of good practice.

Thus, in addition to helping teachers see potential differences in behavior and goals, we hope the data will stimulate

more articulate conceptualizations about what could take place in the classroom. To reiterate, the value of whatever alternative ideas of classroom practice emerge from our deliberations and interactions with teachers will have to be determined. However, in addition to the findings (i.e. what impact does the treatment have?), the process of feedback and working with teachers to form a treatment represents an area of inquiry as well. In particular, it will be important to see if the feedback mechanisms are useful in creating and sustaining a healthy exchange between the research team and classroom teachers, and to learn what value teachers place on the feedback that we and others (e.g. Shulman, et al., 1978) see as potentially useful for helping teachers to see and assess their classroom behavior.

References

Braun, C. Teacher expectation: Socio-psychological dynamics. Review of Educational Research, 1976, 46, 185-213.

Brophy, J. and Evertson, C. Learning from teaching: A developmental perspective. Boston: Allyn and Bacon, 1976.

Brophy, J. and Good, T. Teacher-student relationships: Causes and consequences. New York: Holt, Rinehart & Winston, 1974.

Doyle, W. Task structures and student roles in classrooms. Paper presented at the annual meeting of the American Educational Research Association, Toronto, 1978.

Fuller, F. Concerns of teachers: A developmental conceptualization. American Educational Research Journal, 1969, 6, 207-226.

Good, T. Classroom expectations: Teacher-pupil interactions. In J. McMillan (Ed.), The social psychology of school learning. New York: Academic Press, in press.

Good, T. Teacher effectiveness in the elementary school: What we know about it now. Journal of Teacher Education, 1979, 30, 52-64.

Good, T. and Brophy, J. Changing teacher and student behavior: An empirical investigation. Journal of Educational Psychology, 1974, 66, 390-405.

Good, T. and Grouws, D. The Missouri Mathematics Effectiveness Project: An experimental study in fourth-grade classrooms. Journal of Educational Psychology, 1979, 71, 355-362.

Hook, C. and Rosenshine, B. Accuracy of teacher reports of their classroom behavior. Review of Educational Research, 1979, 49, 1-12.

Nash, R. Classrooms observed: The teacher's perception and the pupil's performance. London: Routledge and Kegan Paul, Ltd., 1973.

Rosenthal, R., Hall, J., Dimatteo, R., Rogers, P., and Archer, D. Sensitivity to nonverbal communication. Baltimore: Johns Hopkins University Press, 1979.

Sheperd, J. Lost at C. Playboy, May 1978, 143-144; 192-196; 198.

Shulman, L., Good, T., Kilpatrick, J., Lesh, R., Lightfoot, S., Mehan, H., Novak, J., and Rowe, M. Research on teaching/learning processes. Panel Report Commissioned by the National Science Foundation Education Directorate, 1978.

Stipek, D. Changes during first grade in children's social-motivational development. Unpublished doctoral dissertation, Yale University, 1977.

Weinstein, R. Reading group membership in first grade: Teacher behaviors and pupil experience over time. Journal of Educational Psychology, 1976, 68, 103-116.

Weinstein, R. and Middlestadt, S. Student perceptions of teacher interactions with male high and low achievers. Journal of Educational Psychology, 1979, in press.

Winne, P. and Marx, R. Reconceptualizing research on teaching. Journal of Educational Psychology, 1977, 69, 668-678.

A Group of Selected References

Bandura, A. Self-efficacy: Toward a unifying theory of behavior change. Psychological Review, 1977, 84, 191-215.

Braun, C. Teacher expectation: Sociopsychological dynamics. Review of Educational Research, 1976, 46 (2), 185-213.

Brophy, J. & Good, T. Teacher-child dyadic interaction: A manual for coding classroom behavior. Austin: Research and Development Center for Teacher Education, 1968.

Brophy, J. & Good, T. Teachers' communication of differential expectations for children's classroom performance: Some behavioral data. Journal of Educational Psychology, 1970, 61, 365-374.

Brophy, J. & Good, T. Teacher-student relationships: Causes and consequences. New York: Holt, Rinehart and Winston, 1974.

Cooper, H. Controlling personal rewards: Professional teachers differential use of feedback and the effects of feedback on the student's motivation to perform. Journal of Educational Psychology, 1977, 69 (4), 419-427.

Cooper, H. Pygmalion grows up: A model for teacher expectation communication and performance influence. Review of Educational Research, 1979a.

Cooper, H. Some effects of preperformance information on academic expectations. Journal of Educational Psychology, 1979b, 71 (3), 375-380.

Cooper, H. A theoretical and methodological overview. In R. Baron (chair), Understanding Pygmalion: The social psychology of self-fulfilling classroom expectations. Symposium presented to the meeting of the American Psychological Association, New York, 1979c.

Cooper, H. & Baron, R. Academic expectations and attributed responsibility as predictors of professional teachers' reinforcement behavior. Journal of Educational Psychology, 1977, 69 (4), 409-418.

Cooper, H. & Baron, R. Academic expectations, attributed responsibility and teachers' reinforcement behavior: A suggested integration of conflicting literatures. Journal of Educational Psychology, 1979, 71 (2), 274-277.

Cooper, H., Baron, R. & Lowe, C. The importance of race and social class in the formation of expectancies about academic performance. Journal of Educational Psychology, 1975, 67 (2), 312-319.

Cooper, H., Blakey, S., Burger, J., Good, T., Hinkel, G. & Sterling, J. Teacher-child dyadic interaction: Coding manual for social and educational research in attribution theory, teacher expectations and learned helplessness theory. Technical Report #167, Center for Research in Social Behavior, Columbia, Mo., 1979.

Cooper, H. & Burger, J. Internality, stability and personal efficacy: A categorization of free response academic attributions. In press, American Educational Research Journal.

Cooper, H., Burger, J. & Seymour, G. Classroom context and student ability as influences on teacher personal control and success expectations. American Educational Research Journal, 1979, 16 (2), 189-196.

Cooper, H. & Lowe, C. Task information and attributions for academic performance by professional teachers and role players. Journal of Personality, 1977, 45 (4), 469-483.

Cooper, H., Lowe, C. & Baron, R. Pattern of past performance and expected future performance: A reversal of the unexpected primal effect. Journal of Applied Social Psychology, 1976, 6 (1), 31-39.

Crandall, V., Katkousky, W. & Crandall, V. Children's beliefs in their own control on reinforcements in intellectual-academic achievement situations. Child Development, 1965, 36, 91-109.

Cronbach, L. Research on classrooms and schools: Formulation of questions, design and analysis. Stanford Evaluation Consortium, Stanford University, Stanford, California, 1976 Eric Document No. ED 135 801.

deCharms, R. Personal causation. New York: Academic Press, 1968.

Dusek, J. Do teachers bias children's learning? Review of Educational Research, 1975, 45 (4), 661-684.

Dweck, C. Children's interpretation of evaluative feedback: The effects of social cues on learned helplessness. Merrill-Palmer Quarterly, 1976, 22, 105-109.

Dweck, C. & Reppucci, D. Learned helplessness and reinforcement responsibility in children. Journal of Personality and Social Psychology, 1973, 25 (1), 109-116.

Elashoff, J. & Snow, R. Pygmalion reconsidered. Worthington, Ohio: Charles A. Jones, 1971.

Entwisle, D. & Webster, M. Raising children's performance expectations. Social Science Research, 1972, 1, 147-158.

Good, T. Classroom expectations: Teacher-pupil interactions. In J. McMillan (Ed.) The Social Psychology of School Learning. New York: Academic Press, in press.

Good, T. & Brophy, J. Educational Psychology: A Realistic Approach. New York: Holt, Rinehart and Winston, 1977.

Jensen, A. How much can we boost IQ and achievement? Harvard Educational Review, 1969, 39, 1-123.

Kennelly, R. & Kinley, S. Perceived contingency of teacher administered reinforcements and academic performance of boys. Psychology in the Schools, 1975, 12, 449-453.

Kukla, A. Attributional determinants of achievement-related behavior. Journal of Personality and Social Psychology, 1972, 21, 166-174.

Langer, E. & Rodin, J. The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. Journal of Personality and Social Psychology, 1976, 34, 191-198.

Lanzetta, J. & Hannah, T. Reinforcing behavior of "naive" trainers. Journal of Personality and Social Psychology, 1969, 11, 245-252.

Lefcourt, H., Hogg, E., Struthers, S. & Holmes, C. Causal attributions as a function of locus of control, initial confidence, and performance outcomes. Journal of Personality and Social Psychology, 1975, 32, 391-397.

Luce, S. & Hoge, R. Relations among teacher rankings, pupil-teacher interactions and academic achievement: A test of the teacher expectancy hypothesis. American Educational Research Journal, 1978, 15 (8), 489-500.

McMillan, J. A quasi-experimental study of the effect of effort and feedback on the formation of student attitudes. Unpublished doctoral dissertation, Northwestern University, 1976.

Meyer, W. Academic expectations, attributed responsibility and teacher reinforcement behavior: A comment to Cooper and Baron with some additional data. Journal of Educational Psychology, 1979.

Myers, J. Fundamentals of experimental design (2nd Ed.). Boston: Allyn and Bacon, 1972.

Page, E. Statistically recapturing the richness within the classroom. Psychology in the Schools, 1975, 12 (3), 339-344.

Phares, E. Locus of control in personality. Morristown, N. J.: General Learning Press, 1976.

Riemer, B. Influence of causal beliefs on affect and expectancy. Journal of Personality and Social Psychology, 1975, 31, 1163-1167.

Rosenthal, R. On the social psychology of the self-fulfilling prophecy: Further evidence for Pygmalion effects and their mediating mechanisms. New York: MSS Modular Publications, 1974.

Rosenthal, R. & Fode, K. Three experiments in experimenter bias. Psychological Reports, 1963, 12, 491-511.

Rosenthal, R. & Jacobson, L. Pygmalion in the classroom: Teacher expectation and pupils' intellectual development. New York: Holt, Rinehart and Winston, 1968.

Sarbin, T. & Allen, V. Increasing participation in a natural group setting: A preliminary report. Psychological Record, 1968, 12, 1-7.

Seligman, M. Helplessness: On depression, development and death. New York: Freeman, 1975.

Soar, R. S. & Soar, R. M. Setting variables, classroom interaction and multiple pupil outcomes. Final Report, National Institute of Education, Basic Skills, June, 1978.

Thorndike, R. Review of Pygmalion in the classroom. American Educational Research Journal, 1968 (5), 708-711.

Weiner, B. Achievement motivation and attribution theory. Morristown, N. J.: General Learning Press, 1974.

Weiner, B. An attributional approach to educational psychology. In L. Shulman (Ed.) Review of research in education, Vol. 14. Itasca, Illinois: Peacock, 1977.

West, C. & Anderson, T. The question of preponderant causation in teacher expectancy research. Review of Educational Research, 1976, 46 (2), 185-213.

Zytkoskee, A., Strickland, B. and Watson, J. Delay of gratification and internal versus external control among adolescents of low socioeconomic status. Developmental Psychology, 1971, 4, 93-98.